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NOTES ON GEOGRAPHIC DISTRIBUTION

New locality records, geographical distribution, and morphological variation in *Cercosaura parkeri* (Ruibal, 1952) (Squamata: Gymnophthalmidae) from western Brazil

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ABSTRACT: The presence of the gymnophthalmid lizard *Cercosaura parkeri* (Ruibal, 1952) in western Brazil is confirmed, based on vouchered records for localities in the states of Mato Grosso and Mato Grosso do Sul. Morphological variation in a series of 20 males and 17 females is also presented.

Cercosaura parkeri was originally described by Ruibal (1952) as a subspecies of *Pantodactylus schreibersii* (Wiegmann, 1834). Osteological and exo-somatic morphological differences from the nominal form *P. s. schreibersii*, however, led Tedesco and Cei (1999) to propose full specific status for *P. s. parkeri*, subsequently allocated to the genus *Cercosaura* (Doan 2003).

In the original description, *Cercosaura parkeri* is mentioned from the type-locality, Buenavista (occasionally graphed Buena Vista), situated in Ichilo Province, Departamento Santa Cruz, Bolivia (Ruibal 1952). Other localities in Bolivia (see below) and also Vila Murtinho, "Matto Grosso", Brazil, were mentioned in Ruibal (1952). Cristiano Nogueira (unpublished data) misinterpreted and mapped this latter as being Porto Murtinho, situated in the state of Mato Grosso do Sul, in the southwestern limits of the Pantanal wetlands. However, it is likely that the specimen UMMZ 56900 (deposited at University of Michigan Museum of Zoology) referred by Ruibal (1952) was in fact obtained at Vila Murtinho, southwestern Rondônia state, Brazil. Presently belonging to the municipality of Nova Mamoré, Vila Murtinho is situated on the right bank of upper Rio Madeira, right in front of the mouth of the Beni River. At the time of the collection of the specimen, on April 1922, "Matto Grosso" was a huge area, subsequently divided into three new states (Rondônia, Mato Grosso, and Mato Grosso do Sul). Additionally, the collector's name is not mentioned in the catalogue of the UMMZ, and it is not possible to check travelling routes.

Vouchered records of *Cercosaura parkeri* in the literature are restricted, until now, to localities in only three South American countries: Argentina, Bolivia, and Brazil. In Argentina, the species is known from the provinces of Tucumán (Cerro San Javier), Salta and Jujuy (Viñas and Daneri 1991). In Bolivia, there are literature records for Ixiamus (misspelling of Ixiamas), Rurrenabaque, and Tumupasa, according to Ruibal (1952); Nor Yungas, and Yungulosa, according to Avila-Pires (1995). In this latter country, the species is also known from localities in the departments of Beni (province of Vacadiez: Guayaramerin), Cochabamba (Villa Granado), according to Cristiano Nogueira (unpublished data), La Paz (province of Sud Yungas: Chulumani and Yanacachi; province of Nor Yungas: Puerto Linares), Santa Cruz (provinces of Chiquitos, Manuel M. Caballero, and Florida), and Tarija (province of Gran Chaco: Sunchal, Villamontes), according to Doan (2003) and records held in the following institutions and accessed through the HerpNET (2012) data portal: American Museum of Natural History, New York; Museum of Comparative Zoology, Harvard University, Cambridge; Smithsonian National Museum of Natural History, Washington, D.C.

In spite of an old putative record of *Cercosaura parkeri* for southeastern lowlands of Peru (see Ruibal 1952), the occurrence of the species in this country can only be confirmed, until now, for the department Madre de Dios (Tiffany M. Doan, unpublished data). For the Peruvian record, as well as Bolivian records for which coordinates are not mentioned in HerpNET, localities in the distribution map presented herein (Figure 1) correspond to the capital of mentioned departments.

In Brazil, besides Vila Murtinho there are references to the municipalities of Jaci-Paraná, Porto Velho (Nascimento *et al*. 1988), and Costa Marques, Forte Príncipe da Beira (Avila-Pires 1995), Rondônia state; Chapada dos Guimarães (Cristiano Nogueira, unpublished data) and Porto Estrela, Estação Ecológica da Serra das Araras (Nogueira *et al*. 2009), Mato Grosso state. Surprisingly, *Cercosaura parkeri*

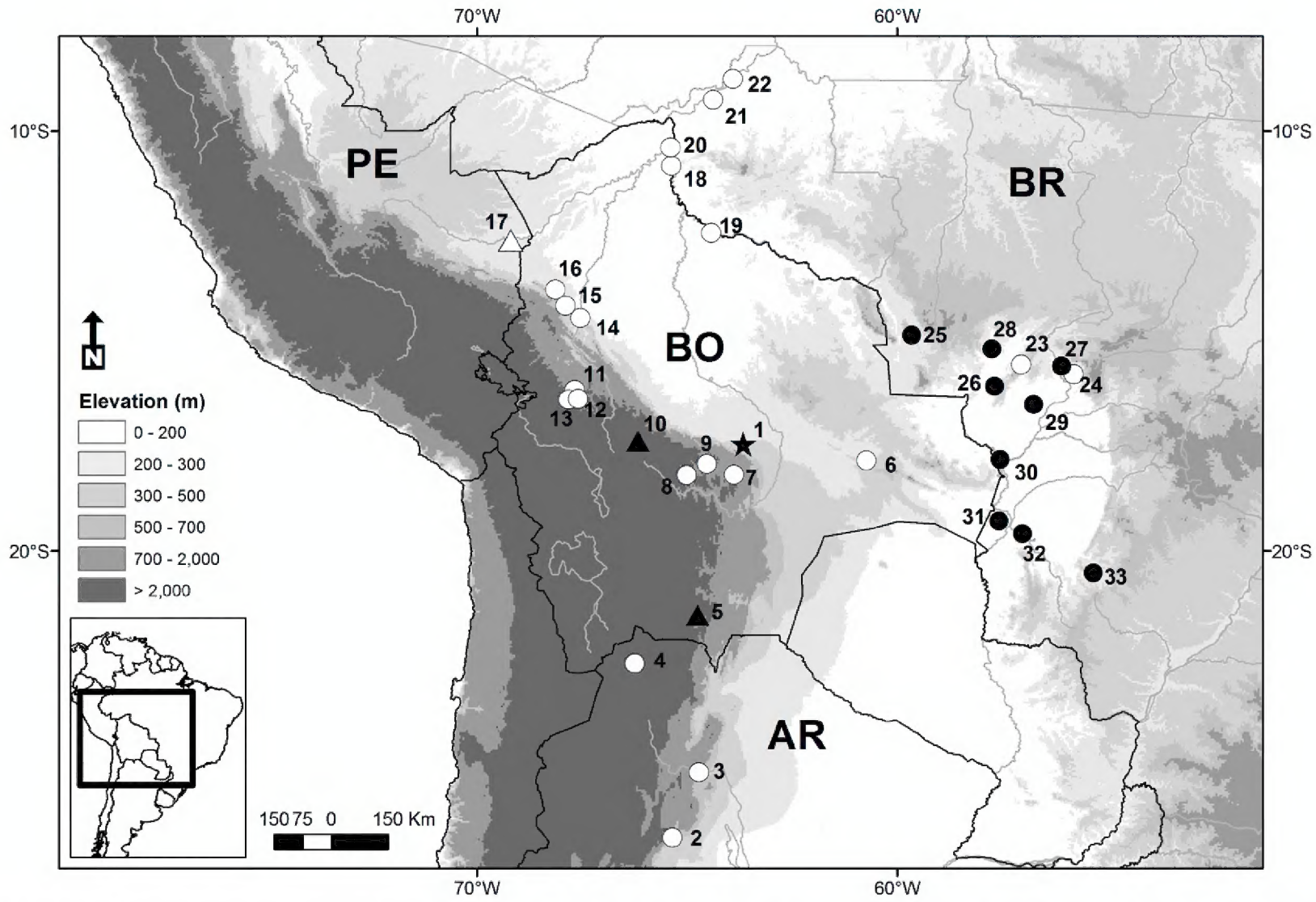

Figure 1. Distribution of *Cercosaura parkeri* in Argentina (AR), Bolivia (BO), Brazil (BR), and Peru (PE). Star – type-locality: Buenavista (1); open circles – literature records (from Ruibal 1952; Nascimento et al. 1988; Viñas and Daneri 1991; Avila-Pires 1995; Doan 2003; Nogueira et al. 2009; Cristiano Nogueira, unpublished data): Tucuman (2), Salta (3), Jujuy (4), S.J. Chiquitos (Chiquitos; 6), Samaipata (Florida; 7), Villa Granado (8), Comarapa (Manuel M. Caballero; 9), Nor Yungas (11), Chulumani (12), Yanacachi (13), Rurrenabaque (14), Tumupasa (15), Ixiamas (16), Guayaramerin (18), Costa Marques (19), Nova Mamoré (= Vila Murtinho; 20), Jaci-Paraná (21), Porto Velho (22), Porto Estrela (23), Chapada dos Guimarães (24); closed circles – data from the present work: Vila Bela da Santíssima Trindade (25), Cáceres (26), Cuiabá (27), Jangada (28), Poconé (29), Corumbá (Faz. Acurizal, Amolar, 30; Morro Sta. Cruz, Urucum, 31; Base de Estudos do Pantanal da UFMS, Rio Miranda, 32), and Dois Irmãos do Buriti (33); closed triangles – data from HerpNET (2012): Cochabamba (10) and Villamontes (5); open triangle – unpublished data provided by Tiffany M. Doan: Puerto Maldonado (17).

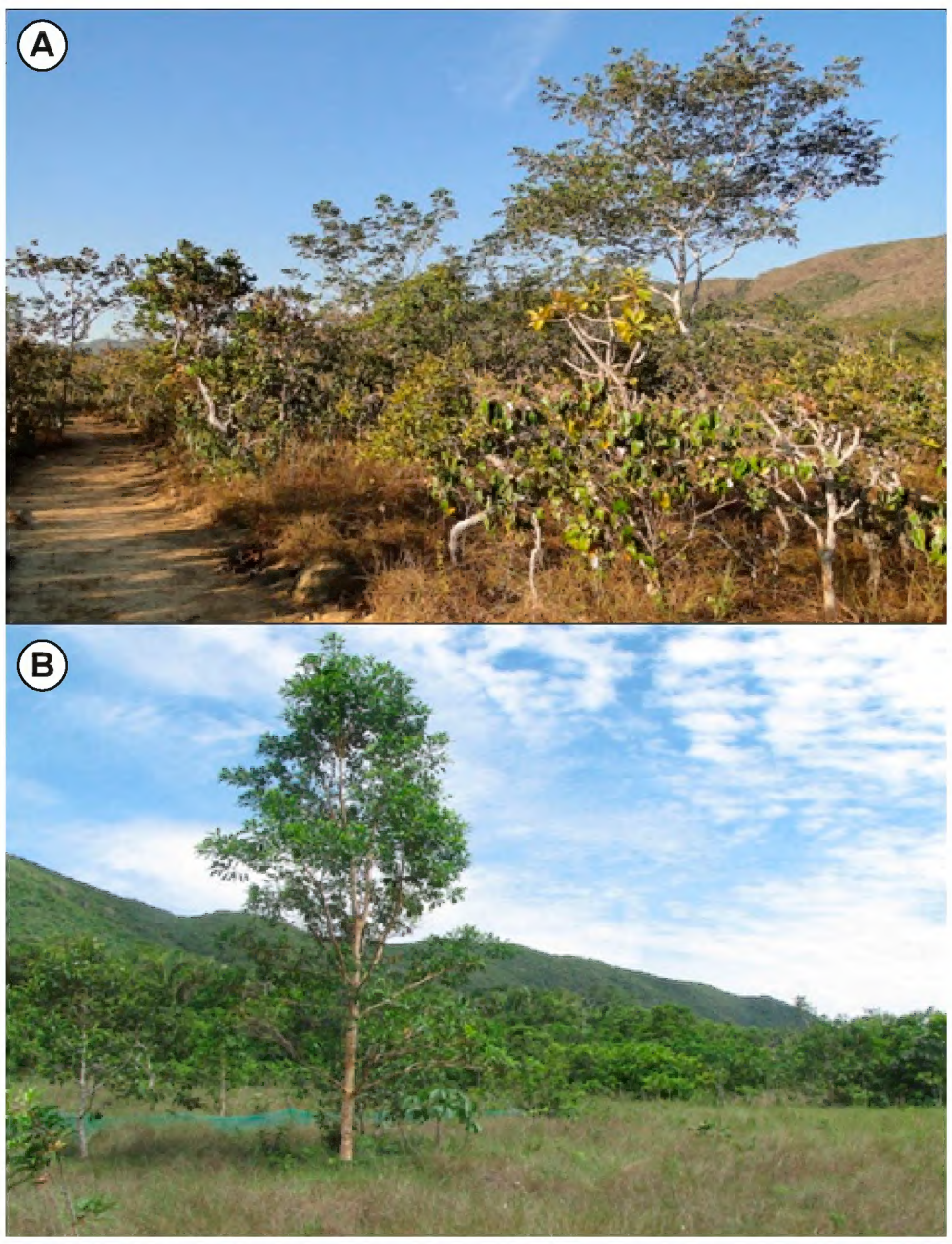

Figure 2. Cerrado phytophysiognomies occupied by *Cercosaura parkeri* at Estação Ecológica da Serra das Araras (Porto Estrela, Mato Grosso, Brazil). (A) cerrado stricto sensu; (B) parque de cerrado (definitions of phytophysiognomies according Ribeiro and Walter 2008) (photos: R. Valadão).

is not present in the official list of Brazilian reptile species (Bérnils and Costa 2011).

During a recent mid-term inventory of the herpetofauna of Estação Ecológica da Serra das Araras (15°38' S, 57°12' W), specimens of *Cercosaura* were obtained (collection permit IBAMA/SISBIO #19518-1) in open, savannah-like habitats from the Cerrado (a huge ecoregion of open vegetation covering most of central Brazil; see Olson *et al*. 2001). Specimens were found in phytophysiognomies of *cerrado stricto sensu* (Figure 2A) and *parque de cerrado* (Figure 2B), both defined in Ribeiro and Walter (2008). These specimens fit available diagnoses of *Cercosaura parkeri* (Ruibal 1952; Avila-Pires 1995; Tedesco and Cei 1999; Doan 2003).

Examination of additional material, previously deposited in the "Coleção Zoológica de Vertebrados da Universidade Federal de Mato Grosso" (UFMT; Cuiabá, Mato Grosso, Brazil), and in "Coleção Zoológica de Referência do Campus de Corumbá, Seção Herpetologia, da Universidade Federal de Mato Grosso do Sul" (CEUCH; Campo Grande, Mato Grosso do Sul, Brazil), allowed us to confirm the presence of *Cercosaura parkeri* in seven additional localities in western Brazil. Five of them are situated in the state of Mato Grosso: municipalities of Cuiabá (*campus* of the Universidade Federal de Mato Grosso, 15°35' S, 56°05' W), Jangada (15°10' S, 57°44' W), Cáceres (Fazenda Baía de Pedra, distrito do Limão, 16°28' S, 58°08' W; collection permit IBAMA/SISBIO #17952-1), Vila Bela da Santíssima Trindade (Projeto São Francisco, 14°51' S, 59°39' W), and Poconé (Fazenda Pouso Alegre, 16°30' S, 56°45' W; collection permit IBAMA/SISBIO #13429-2).

Two other localities are situated in the state of Mato Grosso do Sul: municipalities of Corumbá (Reserva Particular do Patrimônio Natural Acurizal, 17°49' S, 57°33' W; collection permit IBAMA/CGEUC #183/2002; Morro Santa Cruz, 19°12' S, 57°34' W, collection permit IBAMA/DIFAS #009/99; Base de Estudos do Pantanal da UFMS, 19°57' S, 57°01' W, collection permit IBAMA/SISBIO #10640-2) and Dois Irmãos do Buriti (Fazenda Santa Helena, 20°30' S, 55°19' W, collection permit IBAMA/SISBIO #10640). In Brazil, therefore, confirmed records are for the states of Rondônia, Mato Grosso, and Mato Grosso do Sul (Figure 1).

In Table 1 and Table 2 we summarize available data, respectively, on morphometric and meristic characters of specimens assigned to *Cercosaura parkeri*, based on published information and on material from Mato Grosso state deposited at UFMT (20 males and 17 females). Sex of examined specimens was determined based on number of femoral pores, according to Ruibal (1952) and Avila-Pires (1995). Only specimens measuring above 30.00 mm of snout-vent length were examined. Morphometric data were taken with a caliper (to the nearest 0.01 mm), for the most part following Avila-Pires (1995). Eye-nostril distance was measured from the posteriormost point of nostril to the anteriormost point of the eye from the same side; snout-nostril distance was measured from the tip of the snout to the anteriormost point of the right eye; femoral pores were counted in the right side. Scale counts and scale nomenclature are according to Avila-Pires (1995).

From the five morphometric characters analyzed (Table 1), only snout-vent length range (SVL; 32.30–48.00 mm) was previously mentioned in the literature for this species (Ruibal 1952; Avila-Pires 1995; Tedesco and Cei 1999). No statistic sexual dimorphism in SVL was detected in our sample (*t*-test, df = 29.1, p = 0.963), as already noted in the original description (Ruibal 1952). For other 13 characters evaluated (Tables 1 and 2), sexual statistical differences were only detected in the number of femoral pores (*t*-test, df = 35, p < 0.001). Additionally, males obtained from October to January (presumably, adults during reproductive activity) exhibited vivid red colors in the ventro-lateral portions of the body and tail (Figure 3). In gymnophthalmids, marked sexual dichromatism in ventral and/or ventro-lateral regions of adults was already reported, at least, for *Colobosaura modesta* (Reinhardt and Lütken, 1862), in which red-bellied males were once considered to represent a new species (Cunha 1977), and for *Ptychoglossus bicolor* (Werner, 1916) (Anaya-Rojas *et al*. 2010).

Dorsal color pattern may vary within and between populations, with some individuals presenting a marked vertebral (sometimes also paravertebral) dark line, and others presenting an ill-defined or absent vertebral line (see Ruibal 1952; Vinãs and Daneri 1991; Tedesco and Cei 1999). Nevertheless, as already pointed in the original description (Ruibal 1952), a white stripe passing below the eyes through the lower half of the ear and along the side of the body is present in all examined specimens (Figure 4), readily distinguishing them from congeners. Similarly to the morphometric and color pattern, meristic data in our sample also fit well the variation reported in the literature, sometimes only slightly exceeding published values (Table 2).

Table 1. Morphometric characteristics (in mm) of specimens of *Cercosaura parkeri* deposited at "Coleção Zoológica de Vertebrados da Universidade Federal de Mato Grosso" (UFMT). Literature data according to Ruibal (1952), Avila-Pires (1995), and Tedesco and Cei (1999).

	Males (n=20) mean ± standard deviation (min –max)	Females (n=17) mean ± standard deviation (min – max)	Literature data (min – max)
Snout-vent length	37.53 ± 3.21 (31.33–43.58)	37.59 ± 4.32 (30.87–47.71)	(32.30–48.00)
Head length	10.64 ± 0.87 (9.23–12.54)	10.24 ± 0.93 (8.78–11.85)	-
Head width	5.76 ± 0.87 (9.23–12.54)	5.48 ± 0.58 (4.45–6.60)	-
Eye-nostril distance	2.18 ± 0.34 (1.63–2.77)	2.07 ± 0.31 (1.29–2.67)	-
Snout-nostril distance	0.90 ± 0.15 (0.60–1.20)	0.89 ± 0.16 (0.48–1.16)	-

Table 2. Meristic characters of specimens of *Cercosaura parkeri* deposited at "Coleção Zoológica de Vertebrados da Universidade Federal de Mato Grosso" (UFMT). Literature data according to Ruibal (1952), Viñas and Daneri (1991), Avila-Pires (1995), Tedesco and Cei (1999), and Doan (2003).

	Males (n=20) min – max (rigth/left or total count: frequency)	Females (n=17) min – max (rigth/left or total count: frequency)	Literature data (min – max)
Femoral pores	3–5 (3/3: 20%; 3/4: 30%; 4/4: 35%; 5/5: 15%)	1–3 (1/1: 12%; 1/2: 17%; 2/2: 59%; 3/3: 12%)	Males 2–6; Females 1–3
Scales in the posterior preanal plate	2	2	2–3
Scales around midbody	24–30 (24: 5%; 25: 10%; 26: 15%; 27: 10%; 28: 35%; 29: 20%; 30: 5%)	25–29 (25: 18%; 26: 18%; 27: 35%; 28:11%; 29: 18%)	20–29
Dorsals in a transverse row	26–33 (26: 5%; 27: 5%; 28: 20%; 29: 20%; 30: 30%; 31: 15%; 32:5%)	29–33 (29: 23%; 30: 27%; 31: 23%; 32: 17%; 33: 10%)	28–36
Ventrals in a transverse row	18–22 (18: 10%; 19: 40%; 20: 35%; 21: 10%; 22: 5%)	18–22 (18: 29%; 19: 29%; 20: 29%; 21: 7%; 22: 6%)	17–25
Ventrals in a longitudinal row	6	6	6
Supralabials	6-8 (6/6: 5%; 6/7: 5%; 7/7: 85%; 8/8: 5%)	5-8 (6/6: 12%; 6/7: 6%; 7/5: 6%; 7/7: 70%; 7/8: 6%)	-
Infralabials	5-7 (6/6: 65%; 7/7: 25%; 6/5: 5%; 6/7: 5%)	5-7 (5/5: 6%; 5/6: 12% 6/6: 64%; 6/7: 12%; 7/7: 6%)	-
Postoculars	3	3	3

Records herein reported and those in the literature confirm that *Cercosaura parkeri* occurs from Bolivian and Argentinean Chaco to the western portion of the Cerrado, in Brazil, and to the southwestern Amazonia, in Bolivia and Peru. Available literature information on habitat suggests that this species primarily occurs in either open vegetation or open types of forests (Avila-Pires 1995). In Bolivia, the type-locality Buenavista lies "in a disturbed transition forest (Semideciduous Chiquitano Forest and Tropical Humid Forest)", according to Clarke (2009). In western Brazil, *C. parkeri* was found in semideciduous forest at Morro Santa Cruz, in the western border of the Brazilian Pantanal (Urucum massif, Corumbá, Mato Grosso do Sul; Vanda Lúcia Ferreira, unpublished data) and in three different phytophysiognomies of Cerrado, representing an environmental gradient from more vegetated to more open habitats: *cerradão* (Cristiano Nogueira and Vanda Lúcia Ferreira, unpublished data), *cerrado stricto sensu* and *parque de cerrado* (this work). However, in Argentina specimens were found in areas of tropical humid forest (Viñas and Daneri 1991; Cei 1993), and parts of the departments of La Paz, Beni, and Pando, in Bolivia, and Madre de Dios, in Peru, are covered by Amazonian rainforest (Tiffany M. Doan, personal communication).

In some localities, *Cercosaura parkeri* occurs in sympatry with at least one congener. In Mato Grosso, the species is sympatric to *Cercosaura ocellata* (Wagler, 1830) at Estação Ecológica da Serra das Araras, Porto Estrela, and in the region of Manso hydroelectric powerplant, Chapada dos Guimarães. In this latter locality, it is also sympatric with an unidentified species belonging to the *C. schreibersii* complex. In Mato Grosso do Sul, *C. parkeri* occurs in sympatry with another unidentified species from the same complex, at Dois Irmãos do Buriti (Vanda Lúcia Ferreira, unpublished data).

Specimens examined: UFMT 0008, 0278, 0290, 0293, 1979, 2123, 2367, 2836, 2905, 2959, 2960, 2967, 3016, 3642, 3707, 6218, 6729, 6825, 6826, 6839, 6927, 6976, 6981, 6988, 8318, 8395, 9046, 9047, 9048, 9049, 9050, 9051, 9057, 9850, 9851, 9852, 9853; CEUCH 1891, 2845, 2855, 3497, 3498, 3548, 3811, 3812.

Figure 3. Male individuals of *Cercosaura parkeri* in life: (A) individual from Projeto São Francisco, Vila Bela da Santíssima Trindade, Mato Grosso, Brazil (UFMT 3016, snout-vent length 38.7 mm; photo: C. Strüssmann); (B) individual from Estação Ecológica da Serra das Araras, Porto Estrela, Mato Grosso, Brazil (UFMT 8318, snout-vent length 44.9 mm, tail length 97.7 mm, mass 2.4 g) (photo: R. Valadão).

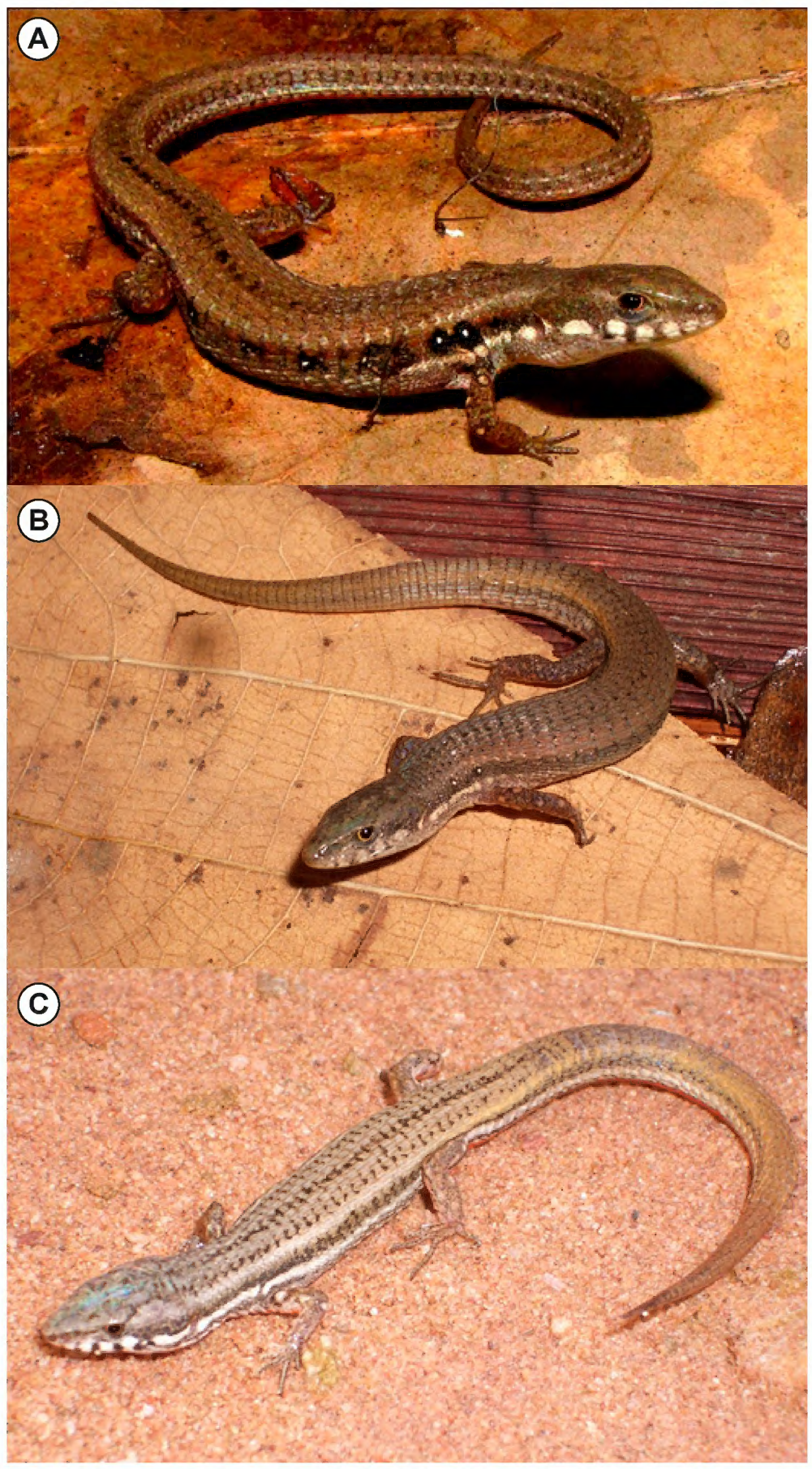

Figure 4. Variation in dorsal color pattern of live specimens of *Cercosaura parkeri.* (A) Individual from Estação Ecológica da Serra das Araras, Porto Estrela, Mato Grosso, Brazil (UFMT 8318, male, snout-vent length 44.9 mm, tail length 97.7 mm, mass 2.4 g) (photo: R. Valadão); (B) individual (not collected) from Vãozinho, Barra do Bugres, Mato Grosso, Brazil (photo: C. Strüssmann); (C) individual from Projeto São Francisco, Vila Bela da Santíssima Trindade, Mato Grosso, Brazil (UFMT 3016, male, snout-vent length 38.7 mm) (photo: C. Strüssmann).

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